CLAIMS

1. Positive working thermal imaging assembly comprising

A - a substrate; and

B - a thermally sensitive imaging element of a composite layer structure comprising

a first layer on the substrate of a polymeric material soluble in aqueous alkali solution, optionally containing compounds that absorb and convert light to heat and/or a coloured dye or pigment;

said first layer being converted at its surface by treatment with solutions at elevated temperatures that contain an active compound or compounds capable of rendering said first polymeric material insoluble to aqueous alkali developer at the point of contact ; the first layer being oleophilic.

optionally, a first intermediate layer between the substrate and the said first layer with a second polymeric material which is soluble or dispersible in aqueous solution optionally containing compounds that absorb and convert light or radiation to heat and/or a coloured dye or pigment coated from a solvent that does not substantially dissolve the first layer.

optionally, a third or top layer over the converted first layer and composed of a second polymeric material which is soluble or dispersible in aqueous solution optionally containing compounds that absorb and convert light or radiation to heat and/or a visible coloured dye or pigment; the first intermediate layer and the third layer being applied with a solvent that does not substantially dissolve the converted first layer.

2. Positive working thermal imaging assembly according to claim 1 wherein the first intermediate layer and the third layer are mutually exclusive regarding IR absorbing/converting compounds and visible coloured dye or pigment.

3. Positive working thermal imaging assembly according to claim 1 wherein If either the first intermediate layer or third layer contain both IR absorbing/converting compounds and visible dyes the other layer is absent from the assembly.

4. Positive working thermal imaging assembly according to claim 1 wherein the first layer contains both the IR absorbing compounds and visible dyes are present in the first layer and are absent from the intermediate and third layers.

5. Positive working thermal imaging assembly according to claim 1 wherein the first layer is treated by contact with a solution of a compound that renders the surface of said second layer insoluble to aqueous alkaline developer where the contact process is for 1 to 120 seconds at a temperature of 50 to 120°C.

6. Positive working thermal imaging assembly according to claim 5 wherein the contact process is for 10 to 90 seconds at a temperature of 60 to 100oC.

7. Positive working thermal imaging assembly according to claim 6 wherein the contact process is for 20 to 60 seconds at a temperature of 70 to 90oC.

8. Positive working thermal imaging assembly according to claim 5 wherein the contact process is carried out by using a solution containing a non-solvent for the first layer.

9. Positive working thermal imaging assembly according to claim 8 wherein the contact process is made by using toluene or water.

10. Positive working thermal imaging assembly according to claim 5 wherein the active compound used for the treatment of the first layer is selected form Monazoline C, Solsperse 20,000, Solsperse 27,000, Carbowax, CAB-551, and Triton X100.

11. Positive working thermal imaging assembly according to claim 10 wherein the active compound is in a solution containing 0.001 and 0.25 weight % thereof.

12. Positive working thermal imaging assembly according to claim 11 wherein the active compound is in a solution containing 0.005 and 0.10 weight % thereof.

13. Positive working thermal imaging assembly according to claim 11 wherein the active compound is in a solution containing 0.01 and 0.075 weight % thereof.

14. Positive working thermal imaging assembly according to claim 1, wherein the polymeric material of the first layer is phenolic resin, polyvinylphenol or mixture thereof.

15. Positive working thermal imaging assembly according to claim 14, wherein the polymeric material of the first layer includes a novolac resin.

16. Positive working thermal imaging assembly according to claim 14, wherein the polymeric material of the first layer includes a Novolac resin and the active compound used to treat the same is Solsperse.

17. Positive working thermal imaging assembly according to claim 1, wherein the second polymeric material of the first intermediate layer and third layer is selected from polyvinylalcohol, polyvinylpyrrolidone, polyvinylmethyl ether and polyvinylethyl ether.

18. Positive working thermal imaging assembly according to claim 1, wherein the IR absorber and converter is selected from a pigment or dyestuff that absorbs radiation between the wavelengths of 700 and 1200nm.

19. Positive working thermal imaging assembly according to claim 18 wherein the IR absorber/converter is a pigment selected from Milori Blue or Carbon Black.

20. Positive working thermal imaging assembly according to claim 18 wherein the IR absorber/converter wherein the IR absorber/converter is a dye.

21. Positive working thermal imaging assembly according to claim 1 basically comprising the first layer onto the substrate; the first layer being treated at the upper surface.

22. Positive working thermal imaging assembly according to claim 1, comprising the first layer, the intermediate layer and the third layer.

23. Process for preparing a positive working thermal imaging assembly comprising

A - a substrate; and

B - a thermally sensitive imaging element of a composite layer structure; the process comprising

(i) applying on the substrate a first layer of a first polymeric material soluble in aqueous alkali solution, optionally containing compounds that absorb and convert light to heat and/or a coloured dye or pigment; the first layer being oleophilic;

(ii) treating the said first layer at its surface with solutions at elevated temperatures that contain an active compound or compounds capable of rendering said first polymeric material insoluble to aqueous alkali developer at the point of contact ;

optionally, and before step (i) , applying a first intermediate layer between the substrate and the said first layer with a second polymeric material which is soluble or dispersible in aqueous solution optionally containing compounds that absorb and convert light or radiation to heat and/or a coloured dye or pigment coated from a solvent that does not substantially dissolve the first layer; and

optionally, applying a third or top layer over the treated first layer from step (ii); the third or top layer being composed of a second polymeric material which is soluble or dispersible in

aqueous solution optionally containing compounds that absorb and convert light or radiation to heat and/or a visible coloured dye or pigment;

the first intermediate layer and the third layer being applied with a solvent that does not substantially dissolve the treated or converted first layer.

24. Process according to claim 23, wherein the step (ii) is performed by immersing the substrate containing the first layer in a solution at elevated temperatures that contain an active compound or compounds capable of rendering said first polymeric material insoluble to aqueous alkali developer at the point of contact.

25. Process according to claim 24 wherein the step (ii) is performed by immersing the substrate containing the first layer with a solution of a compound that renders the surface of said second layer insoluble to aqueous alkaline developer; wherein the contact process is for 1 to 120 seconds at a temperature of 50 to 120°C.

26. Process according to claim 25, wherein the step (ii) is performed by immersing the substrate containing the first layer with a solution of a compound that renders the surface of said second layer insoluble to aqueous alkaline developer; wherein the contact process is for 10 to 90 seconds at a temperature of 60 to 100°C.

27. Process according to claim 26, wherein the step (ii) is performed by immersing the substrate containing the first layer with a solution of a compound that renders the surface of said second layer insoluble to aqueous alkaline developer; wherein the contact process is for 20 to 60 seconds at a temperature of 70 to 90°C.

28. Process according to claim 23, wherein the step (ii) is performed by immersing the substrate containing the first layer with a solution containing a non-solvent for the first layer.

29. Process according to claim 28, wherein the step (ii) is performed by immersing the substrate containing the first layer with a solution containing toluene or water.

30. Process according to claim 23, wherein the active compound used for the treatment of the first layer is selected form Monazoline C, Solsperse 20,000, Solsperse 27,000, Carbowax, CAB-551, Triton X100.

31. Process according to claim 23, wherein the active compound is in a solution containing 0.001 and 0.25 weight % thereof.

32. Process according to claim 31, wherein the active compound is in a solution containing 0.005 and 0.10 weight % thereof.

33. Process according to claim 30, wherein the active compound the active compound is in a solution containing 0.01 and 0.075 weight % thereof.

34. Process according to claim 23, wherein the polymeric material of the first layer is phenolic resin, polyvinylphenol or mixture thereof.

35. Process according to claim 23, wherein the polymeric material of the first layer includes a novolac resin.

36. Process according to claim 23 wherein the second polymeric material of the first intermediate layer and third layer is selected from polyvinylalcohol, polyvinylpyrrolidone, polyvinylmethyl ether and polyvinylethyl ether.

37. Process according to claim 23 wherein, wherein the IR absorber and converter is selected from a pigment or dyestuff that absorbs radiation between the wavelengths of 700 and 1200nm.

38. Process according to claim 37 wherein the IR absorber/converter is a pigment selected from Milori Blue or Carbon Black.

39. Process according to claim 37 wherein the IR absorber/converter wherein the IR absorber/converter is a dye.

40. Process according to claim 27, wherein the assembly basically comprises the first layer onto the substrate; the first layer being treated at the upper surface thereof.

41. Process according to claim 27, wherein the assembly basically comprises the first layer first layer onto the substrate; the first layer being treated at the upper surface thereof; the intermediate layer and the third layer.

42. Process according to claim 23, wherein the step (ii) is performed by applying a coating on the substrate by using coating rolls; the coating being formed from a coating solution containing an active compound or compounds capable of rendering said first polymeric material of the first layer insoluble to aqueous alkali developer at the point of contact.

43. A lithographic printing plate, wherein said plate comprises a substrate and a structure B on the same as disclosed in any of the claims 1-22 or a substrate and a structure B as prepared according to any of process claims 1-42.

44. Color proofing films or plates and Photoresist comprising a substrate and a structure B on the same as disclosed in any of the claims 1-22 or a substrate and a structure B as prepared according to any of process claims 1-42.

45. Assembly or process to claim 1 or 23, wherein the binding polymer of the first layer is a first polymer which is a condensation product of phenol, o-chlorophenol, o-, m- or p-cresol, p-hydroxy benzoic acid, 2-naphthol or other aromatic monohydroxy monomer with an aldehyde such as formaldehyde, acetaldehyde, fural, benzaldehyde, or any other aliphatic or aromatic aldehyde.

46. Assembly or process according to claim 45, wherein the binding polymer has a molecular weight in the range from 2,000 to 80,000, more preferably in the range of 4,000 to 40,000 and

most preferably in the range of 7,000 to 20,000, and is preferably a Novolac resin. .

47. Assembly or process according to claim 46, wherein the other polymers are added to the binding polymer for improving the plate performance; the said other polymers being selected from butylated melamine formaldehyde resin; butylated urea formaldehyde resin; a copolymer of vinyl pirrolidone/vinyl acetate.

48 Assembly or process according to claim 47, wherein the infrared-absorbing compounds are dyes able to absorb radiation from 700 to 1200 nm.

49. Assembly or process according to claim 46, layers may contain an infrared-absorbing dye at 830 nm and another infrared-absorbing dye at 1064 nm, allowing the composition to work on distinct infrared-emitting devices.

50. Assembly or process according to claim 46, wherein the infrared absorbers are preferably comprised of dyes from classes including pyridyl, quinolinyl, benzoxazolyl, thiazolyl, benzothiazolyl, oxazolyl and selenazolyl.

51. Assembly according to claim 1or 2, wherein it is used as a graphic printing plate and said plate does not need a heat treatment prior to development.

52. Assembly according to claim 1or 2, wherein said composition is applied onto a lithographic printing plate and said plate is subjected to a heat curing step after development.

53. An assembly or Process as described in the specification and examples.

54. An assembly or Process as described in the previous claims wherein an additive is added to the treated surface of the first layer; the additive being selected from Additive 31 or Additive 11 produced by Dow Corning.